

Claims

1. Coupling element (1) for the decanting, filling and/or emptying of containers, isolated from the environment, comprising
at least a first sealing strip (2) including a flank piece (6) which is elastic, at least in sections, with an inner side (10), an outer side (14), an upper side and/or edge (13, 15) and/or a lower side and/or edge (17, 19), at least a first mounting element (18) on the first end of the flank piece (6), in particular with a rounded, in particular radial, outer circumference or outer circumference section, and/or at least a first inner space (48) for retaining an articulated axis, and at least a second mounting element (20) on the second end, which lies opposite the first end, of the flank piece (6), in particular with a rounded, in particular radial, outer circumference or outer circumference section, and/or at least a second inner space (50) for retaining an articulated axis;
at least a second sealing strip (4) including a flank piece (8) which is elastic, at least in sections, with an inner side (12), an outer side (16), an upper side and/or edge, and/or a lower side and/or edge, at least a first mounting element (22) on the first end of the flank piece (8), in particular with a rounded, in particular radial, outer circumference or outer circumference section, and/or at least an inner space for retaining an articulated axis, and at least a second mounting element (24) at the second end, which lies opposite the first end, of the flank piece (8), in particular with a rounded, in particular radial, outer circumference or outer circumference section, and/or at least an inner space for retaining an articulated axis;
whereby the inner sides (10, 12) of the flank pieces (6, 8) of the first and second sealing strips (2, 4) can be attached to one another to form a seal, at least in sections, whereby the first mounting element (18) of the first sealing strip (2) with the second mounting element (24) of the second sealing strip (4) and the second mounting element (20) of the first sealing strip (2) and the first mounting element (22) of the second sealing strip (4) can respectively be positioned adjacent to one another, with at least in sections reciprocal positioning of the inner sides (10, 12) of the flank pieces (6, 8) of the first and second sealing strips (2, 4), forming the first and second articulated

sections (25, 25'), in particular with common outer surface areas, in particular cylinder surface areas;

at least a first articulated cap (56) which, forming a pivot bearing, can be positioned at least partially over and/or around a first articulated section (25), in particular first and second mounting elements (18, 24), adjacent to one another, of the first and second sealing strips (2, 4), and/or at least a second articulated cap (56'), which forming a pivot bearing, can be positioned, at least partially, over and/or around a second articulated section (25'), in particular second and first mounting elements (20, 22), adjacent to one another, of the first and second sealing strips (2, 4); and/or

at least a first articulated axis for retaining in the first inner space (48) for pivotal mounting of the first articulated section (25), in particular of the first and second mounting elements (18, 24) of the first and second sealing strips (2, 4), and/or at least a second articulated axis for retaining in the second inner space (50) for pivotal mounting of the second articulated section (25'), in particular of the second and first mounting elements (20, 22) of the first and second sealing strips (2, 4).

2. Coupling element (1) in accordance with Claim 1, characterised in that the first and/or second mounting element/s (18, 20, 22, 24) of the first and/or second sealing strip/s (2, 4) are, at least partially, in the form of an annulus (34, 36, 38), and in particular represent bridging arms.
3. Coupling element (1) in accordance with Claim 2, characterised in that the first and/or second mounting element/s (18, 20, 22, 24) of the first and/or second sealing strip/s (2, 4) are attached or attachable to the outer side (14, 16) of the first and/or second end/s of the flank piece (6, 8) of the first and/or second sealing strip/s (2, 4).
4. Coupling element (1) in accordance with Claim 2 or 3, characterised in that

the, in particular annular, first and/or second mounting element/s (18, 20, 22, 24) does/do not extend to the inner side (10, 12) of the flank piece (6, 8) of the first or second sealing strip (2, 4), and in particular has/have a central angle ranging from 90° to 240°.

5. Coupling element (1) in accordance with any of the previous claims, characterised in that the first and/or second articulated cap/s (56, 56') has/have inner dimensions which essentially correspond to the outer dimensions of the adjacent first and/or second mounting elements (18, 24; 20, 22), so that with inner sides (10, 12) of the flank pieces (6, 8) of the first and second sealing strips (2, 4) which are positioned together, the first articulated cap (56) encloses the first and second mounting elements (18, 24) of the first and second sealing strips (2, 4) and the second articulated cap (56') encloses the second and first mounting element (20, 22) of the first and second sealing strips (2, 4), at least partially flush, forming a pivot bearing.
6. Coupling element (1) in accordance with any of the previous claims, characterised in that the first and/or second articulated cap/s (56, 56') comprise an articulated cap cover (66) with an articulated axis, in particular in the form of a hollow cylinder segment, which can be introduced into the first inner space (48) formed from the first and second mounting elements (18, 24) of the first and second sealing strips (2, 4) or into the second inner space (50) formed from the second and first mounting elements (20, 22) of the first and second sealing strips (2, 4).
7. Coupling element (1) in accordance with any of the previous claims, characterised in that the first end (44), in particular of the inner side, (10) of the flank piece (6) of the first sealing element (2) and/or the second end, in particular of the inner side (12), of the flank piece (8) of the second sealing element (4) extend/s into the first inner space (48), in particular up to approximately the central point of the inner space, and/or the second end (46), in particular that of the inner side (10), of the flank piece (6) of the first sealing strip (2) and the first end, in particular of the inner side (12), of the flank piece (8) of the second sealing strip (4) extends into the second inner space, in particular up to approximately the central point of the inner space.

8. Coupling element (1) in accordance with any of the previous claims, characterised in that the first mounting element (18, 22) of the first and/or second sealing strip/s (2, 4) comprises, at least in sections, at least one annular section, and that the second mounting element (20, 24) of the first and/or second sealing strip/s (2, 4) comprises at least two annular sections, spaced apart from one another, whereby the annular section of the first mounting element (18, 22) can be fitted, in particular flush, between two annular sections, spaced apart from one another, of the second mounting element (20, 24), forming a first articulated section 25, and/or whereby the annular section of the second mounting element (20, 24) can be fitted, in particular flush, between two annular sections, spaced apart from one another, of the first mounting element (18, 22), forming a second articulated section 25', respectively forming an inner space for retaining at least one articulated axis.
9. Coupling element (1) in accordance with any of the previous claims, characterised in that the first and second mounting elements (18, 20, 22, 24) of the first and second sealing strips (2, 4) form an essentially uniform cylindrical or spherical outer surface, at least in sections.
10. Coupling element (1) in accordance with any of the previous claims, characterised in that the inner side (10) of the flank piece (6) of the first sealing strip (2) and/or the inner side (12) of the flank piece (8) of the second sealing strip (4) is/are curved, at least in the initial state, in particular in the form of a circle segment.
11. Coupling element (1) in accordance with any of the previous claims, characterised in that with, in particular flush, positioning of the inner sides (10, 12) of the flank pieces (6, 8) of the first and second sealing strips (2, 4), at least one outer side (14, 16) of a flank piece has an outer curve.
12. Coupling element (1) in accordance with any of the previous claims, characterised in that the inner side (10, 12) of at least one flank piece (6, 8) is profiled.

13. Coupling element (1) in accordance with any of the previous claims, characterised by at least one, in particular elastic, protuberant bar (42a, 42b) and/or at least one recessed groove (122, 124) on the inner side of the flank piece of the first and/or second sealing strip/s, which extend/s in particular from the first to the opposite second end of the flank piece (6, 8), preferably parallel to the longitudinal axis of the flank piece.
14. Coupling element (1) in accordance with Claim 13, characterised in that there is at least one protuberant bar in the area of at least one longitudinal edge or in the form of a longitudinal edge and/or that between two longitudinal edges and/or protuberant bars, spaced apart from one another, there is at least one, in particular central, recessed groove.
15. Coupling element (1) in accordance with Claim 13 or 14, characterised in that the protuberant bar in the longitudinal section is essentially in the form of a circle section, in particular with a maximum protuberance in approximately the centre of the flank piece.
16. Coupling element (1) in accordance with any of the previous claims, characterised in that at least one inner wall (10, 12), preferably both inner walls of the flank pieces (6, 8) of the first and second sealing strips (2, 4) have at least one, in particular central, protuberant bar (120) and at least one recessed groove (122, 124) between the protuberant bar (120) and the upper longitudinal edge (126, 128) and at least one recessed groove (122, 124) between the protuberant bar (120) and the lower longitudinal edge (126, 128) of the inner wall (10, 12).
17. Coupling element (1) in accordance with Claim 16, characterised in that the protuberant bar (120) protrudes more strongly from the inner wall (10, 12), at least in sections, than the lower and/or upper longitudinal edges (126, 128) of the same.
18. Coupling element (1) in accordance with any of the previous claims, characterised by

a flexible container (90) or a flexible tube (94) which can be attached or is positioned, in particular along the rims (98a, 98b) or the longitudinal edges (126, 128), on the inner side (10, 12), outer side (14, 16), upper edge and/or lower edge of the flank pieces (6, 8) of the first and/or second sealing strip/s (2, 4), in particular along the whole length of the flank pieces (6, 8).

19. Coupling element (1) in accordance with Claim 18, characterised in that the container (90) or tube (94) covers the whole inner side of the flank pieces (6, 8) of the first and/or second sealing strip/s (2, 4), in particular the edge of the container or the tube corresponds approximately to the edge of the inner side of the flank pieces of the first and/or second sealing strip/s and/or extends over the same.
20. Coupling element (1) in accordance with any of the previous claims, characterised in that the first and/or second sealing strip/s (2, 4) or the flank pieces (6, 8) of the same on the longitudinal upper and/or lower side/s (98a, 98b), in particular respectively comprising the section between the inner (10, 12) and the outer side (14, 16) of the flank piece (6, 8) of the first and/or second sealing strip/s (2, 4), has/have at least one coupling device, in particular in the form of a groove (114a, 114b) and/or clip (92a, 92b).
21. Coupling element (1) in accordance with Claim 20, characterised in that the first and/or second sealing strip/s (2, 4) or the flank pieces (6, 8) of the same on the longitudinal upper side (98a) has/have a groove (114a, 114b) or a clip (92a, 92b) and on the longitudinal lower side (98b) a clip (92a, 92b) or a groove (114a, 114b).
22. Coupling element (1) in accordance with any of the previous claims, characterised in that the first and/or second sealing strip/s, in particular the upper and/or lower side of the flank pieces of the first and/or second sealing strip/s is/are provided with an adhesive, or at least a layer of glue, at least in sections.

23. Coupling element (1) in accordance with any of the previous claims, characterised in that the first and the second sealing strip (2, 4) essentially correspond to one another with regard to shape and/or size.
24. Coupling element (1) in accordance with any of the previous claims, characterised in that the flank piece of the first and/or second sealing strip/s by or on the inner side, in particular extending over the whole length of the inner side, has at least one elastomer or thermoplastic elastomer segment.
25. Coupling element (1) in accordance with any of the previous claims, characterised in that the articulated cap (56) comprises a first and a second articulated cap half (60, 70).
26. Coupling element in accordance with Claim 25, characterised in that the first and/or second articulated cap half/halves (60, 70) has/have a lockable opening (80) in the rounded outer surface for retaining a locking pin (52) of a mounting element and/or at least one locking bolt (84) on a lid's inner side (76) for retaining a mounting element in a recess on the lower or upper side.
27. Coupling element (1) in accordance with any of the previous claims, characterised in that the first and/or second articulated cap/s (56, 56') has/have a pre-specified open section (58, 58') which determines the opening angle of the first and second sealing strips (2, 4) in the area of the first and second articulated sections (25, 25').
28. Coupling element (1) in accordance with any of the previous claims, characterised in that the mounting elements, at least in sections, contain thermoplastic polymers, in particular polyoxyalkylene, preferably polyoxymethylene (POM) and/or polyketone, preferably alternating carbon monoxide/ethylene copolymers, in particular along the rounded outer surfaces.

29. Coupling element (1) in accordance with any of the previous claims, characterised by at least one separate and/or integrated locking unit for, in particular temporary, fixing of the position of the first and/or second sealing strip/s or the flank pieces of the same, and/or at least one separate or integrated cover unit for covering at least one side or surface of the coupling element provided for docking, at least in sections, and in particular isolated from the environment.
30. Coupling element (1) in accordance with any of the previous claims, characterised by at least one removal device which, in particular in the form of a spoon or spatula, is located in the flexible container or the flexible tube.
31. Coupling element in accordance with Claim 30, characterised in that, in sections, the removal device is attachable or attached to the flexible container or tube, in particular at a rear or lower end.
32. Docking device (96) for filling with, decanting and/or emptying bulk goods and/or fluids, isolated from the environment, comprising at least two coupling elements (1, 1') which can be attached and/or docked to one another, in particular flush, in accordance with any of the Claims 1 to 31.
33. Docking device (96) in accordance with Claim 32, characterised in that at least one coupling element (1, 1'), is attachable or attached to a flexible container (90), in particular around the edge of the opening, in particular isolated from the environment.
34. Docking device (96) in accordance with Claim 32 or 33, characterised in that at least one coupling element (1, 1') is attachable or attached to a flexible, tubular moulded piece (94), in particular around the edge, in particular isolated from the environment.
35. Holding device (100) for manipulating coupling elements (1, 1') in accordance with any of the Claims 1 to 31 and/or docking devices (96) in accordance with any of the Claims 32 to 34,

comprising a first retainer and/or locking unit (102) for, in particular flush, retaining and/or locking of the first articulated section (25) and/or of the first articulated cap (56) of a coupling element (1) or of a docking device (96); a second retainer and/or locking unit (104) for, in particular flush, retaining and/or locking of the second articulated section (25') opposite the first articulated section and/or of the second articulated cap (56') of the coupling element (18) or the docking device (96); and a positioning mechanism which is set up in such a way that it moves the first retainer and/or locking unit (102) and the second retainer and/or locking unit (104) towards and away from one another for opening and closing.

36. Holding device in accordance with Claim 35, characterised by
at least one articulated axis for retaining a first and/or second mounting element of the first and/or second sealing strip, in particular of the first and/or second articulated section/s.
37. Holding device (100) in accordance with Claim 35 or 36, characterised in that the first and/or second retainer and/or locking unit have a lower and/or upper, in particular pivotal or displaceable locating mechanism (110, 112).
38. Holding device (100) in accordance with any of the Claims 35 to 37, characterised in that the distance moved by the first and second retainer units (102, 104) towards and/or away from one another is limited.
39. Holding device in accordance with any of the Claims 35 to 38, characterised by
at least one suction device which can be added, or is provided to work in conjunction with the first and/or second holding device/s and/or the first and/or second articulated cap/s and/or the first and/or second articulated section/s of the first and/or second coupling element/s.
40. Holding device in accordance with any of the Claims 35 to 39, characterised by

at least one positioning mechanism which is driven pneumatically, hydraulically or by an electric motor, and which is in particular semi- or fully automatic.

41. Connection device for filling with and/or decanting bulk goods and/or fluids, isolated from the environment, comprising an essentially tubular structure with at least a first and second opening, whereby at least the edge sections of the first and second opening are of a flexible form, and a first coupling element in accordance with Claims 1 to 31 which is attachable or attached to the first opening of the tubular structure, in particular isolated from the environment, and a second coupling element in accordance with any of the Claims 1 to 31, which is attachable or attached to the second opening of the tubular structure, in particular isolated from the environment.

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